

USSR

UDC 677.4.54-171.539.16.04

SLATINA, S. D., KIRILENKO, YU. K., VOL'F, L. A., MEOS, A. I., SHAPIRO, YE. I.,  
VISHNYAKOVA, T. P., PANCHENKOV, G. M., VLASOVA, I. D., KAUCHANSKIY, D. A.,  
and MARNAUSOV, V. A.

"Radiation Resistant Polyvinylalcohol Fibers Containing Ferrocene"

Leningrad, Radiokhimiya, Vol 13, No 5, 1971, pp 786-787

Abstract: Polyvinylalcohol fibers containing ferrocene were obtained by impregnating a freshly formed or thermostabilized PVA-fibers with 5-18% solution of 1,1'-diacetylferrocenylformaldehyde resin [1,1'-DAFF] in acetone. After the impregnation the material was heated to 140-160°C for 10-20 min, resulting in formation of chemical bonds between the hydroxyl groups of the PVA-fiber and the methylal group of 1,1'-DAFF resin (14-18% of chemically bound 1,1'-DAFF resin). The 1,1'-DAFF resin was obtained by polycondensation of diacetylferrocene with formaldehyde in ethanol at 50°C and in presence of sodium carbonate. The modified fiber was subjected to  $\gamma$ -radiation in presence of air oxygen. The strength and the elastic indicators of the ferrocene containing material were superior in comparison to the starting material.

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1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--MODIFICATION OF DEHYDRATED POLYVINYL ALCOHOL BY SCHIFF BASES -U-  
AUTHOR--(04)-GABDUVALIYEVA, A.K., KIRILENKO, YU.K., VOLF, L.A., MEOS, A.I.  
COUNTRY OF INFO--USSR  
SOURCE--VYSOKOMOL. SOEDIN., SER. B 1970, 12(3), 227-30  
DATE PUBLISHED--70  
SUBJECT AREAS--CHEMISTRY, MATERIALS  
TOPIC TAGS--POLYVINYL ALCOHOL FIBER, SCHIFF BASE, AZO COMPOUND, CHEMICAL STABILITY, ION EXCHANGE, CHEMICAL REACTION MECHANISM  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--2000/1677 STEP NO--UR/0460/70/012/003/0227/0230  
CIRC ACCESSION NO--AP0125298  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125298

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SEVERAL SCHIFF BASES, CONTG. C:C BONDS, WERE PREPD. BY CONDENSATION OF CH SUB2:CHCH SUB2 NH SUB2 WITH BZH OR ITS DERIVS. THE PHYS. PROPERTIES OF THE UNSATD. AZOMETHINES ARE TABULATED. ALLYL SCHIFF BASES ALSO REACTED WITH PARTIALLY DEHYDRATED POLY(VINYL ALC.) (I) FIBERS IN HCONME SUB2. THE MODIFIED I FIBERS EXHIBITED GOOD PHYSICOMECH. PROPERTIES, HIGH CHEM. STABILITY, AND ION EXCHANGE CAPACITY. A PROBABLE REACTION MECHANISM IS PROPOSED. FACILITY: LENINGRAD. INST. TEKST. LEGK. PROM. IM. KIROVA, LENINGRAD, USSR.

UNCLASSIFIED

1/2 046 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--POSSIBILITY OF STUDYING POLYMER STRENGTH BY MEANS OF POLARIZATION  
INFRARED SPECTROSCOPY -U-  
AUTHOR--(04)-SAVITSKAYA, A.N., KLIMENKO, I.B., ~~VOLE, I.A.~~, ANDROSOV, V.F.  
COUNTRY OF INFO--USSR  
SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(4), 790-3  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY, MATERIALS  
TOPIC TAGS--TENSILE STRENGTH, PLASTIC FILM, ACTIVATION ENERGY, OPTIC  
PROPERTY, POLYVINYL ALCOHOL, PYRROLIDINE, KETONE, COPOLYMER, CHEMICAL  
DECOMPOSITION, PLASTIC DEGRADATION, IR SPECTRUM, SPECTROSCOPIC ANALYSIS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3006/1255 STEP NO--UR/0459/70/012/004/0790/0793  
CIRC ACCESSION NO--AP0134929  
UNCLASSIFIED

2/2 046

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134929

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DICHROISM OF THE BAND AT 916 CM PRIME NEGATIVE1 PLOTTED VS. ORIENTED DRAWING FOR POLYMER FILMS INDICATED THAT POLY(VINYL ALC.) (I) AND I POLY(VINYLPYRROLIDINONE) MIXTS. HAD A SIMILAR DICHORISM, WHEREAS VINYL ALC. N VINYL PYRROLIDINONE COPOLYMER (II) HAD A SLIGHTLY LOWER VALUE. THE ACTIVATION ENERGY OF DEGRADATION WAS ESSENTIALLY THE SAME FOR THE 3 POLYMERS, WHILE THE STRUCTURE SENSITIVE COEFF. OF I1 WAS MARKEDLY HIGHER THAN THAT OF I. THE TENSILE STRENGTH OF THE POLYMERS CAN BE QUAL. EVALUATED FROM THE DICHROISM OF THE CORRESPONDING BANDS. FACILITY: LENINGRAD. INST. TEKST. LEGKOTI PROM. IM. KIROVA, LENINGRAD, USSR.

UNCLASSIFIED

1/2 022 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--TEMPERATURE EFFECT ON THE DEFORMATION PROPERTIES OF HIGH TENACITY  
POLYACRYLONITRILE FIBERS -U-  
AUTHOR-(04)-STALEVICH, A.M., LAZARIDI, K.KH., TIRANOV, V.G., VOLF, L.A.  
COUNTRY OF INFO--USSR  
SOURCE--LEGKA PROM. 1970, (1), 22-4  
DATE PUBLISHED--70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--VISCOELASTICITY, POLYACRYLONITRILE FIBER, TEMPERATURE  
DEPENDENCE, STATIC LOAD TEST  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/0879 STEP NO--UR/0518/70/000/001/0022/0024  
CIRC ACCESSION NO--AP0124542  
UNCLASSIFIED

2/2 022

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124542

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. THE VISCOELASTIC PROPERTIES OF POLYACRYLONITRILE (I) YARN (29.4 TEX) WERE EXAMD. AT STATIC LOADINGS AND AT NEGATIVE40 TO POSITIVE100DEGREES. THE TEMP. DEPENDENCE OF I FIBERS AT VARIOUS LOADINGS AT 100, 70, AND 40DEGREES; THE DEPENDENCE OF THE DEFORMATION AND OF THE DEFORMATION INTENSITY COEFF. ON THE TENSION AT NEGATIVE40, NEGATIVE20, 0, 20, 40, 70, AND 100DEGREES; AND FINALLY THE DEPENDENCE OF THE ELASTICITY ON THE TEMP. WERE DETD. A NEW FORMULA WAS SUGGESTED FOR THE ELASTICITY OF I IN THE GLASSY STATE FOR THE REGION OF LINEAR VISCOELASTICITY. FACILITY: LENINGRAD. INST. TEKST. LEGK. PROM. IM. KIROVA, LENINGRAD, USSR.

UNCLASSIFIED

1/2 029 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--DETERMINATION OF THE CONTENT OF SOME ELEMENTS IN SYNTHETIC FIBERS  
WITH RADIOACTIVE ISOTOPES -U-  
AUTHOR--(04)-VOLF, L.A., KHISLAVSKIY, A.G., PLOTNIKOV, R.I., ZHODZISHSKIY,  
G.A.  
COUNTRY OF INFO--USSR  
SOURCE--KHIM. VOLOKNA 1970, (2), 32-3  
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--SYNTHETIC FIBER, RADIOACTIVE ISOTOPE, CADMIUM ISOTOPE, X RAY  
ABSORPTION, SCINTILLATION COUNTER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3005/0041

STEP NO--UR/0183/70/000/002/0032/0033

CIRC ACCESSION NO--AP0132336

UNCLASSIFIED

2/2 029

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0132336

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONTENT OF SOME ELEMENTS (HAVING AN AT. NO. GREATER THAN OR EQUAL TO 16) IN SYNTHETIC FIBERS WAS DETD. FROM X RAY ABSORPTION DATA. THE EXPTS. WERE CONDUCTED IN AN X RAY PHOTOMETER, USING PRIME 109 CD AS AN IRRADN. SOURCE AND SCINTILLATION COUNTER AS A DETECTOR. THE METHOD WAS RAPID (5 MIN) AND ACCURATE. FACILITY: LITLP IM. KIROVA, LENINGRAD, USSR.

UNCLASSIFIED

1/2 020 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--CHEMICAL STABILITY OF ELECTRON EXCHANGE FIBROUS MATERIALS -U-  
AUTHOR-(04)-BURINSKIY, S.V., TAMAZINA, V.N., VOLF, L.A., MEDS, A.I.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. PRIKL. KHIM. LENINGRAD 1970, 43(4), 851-4  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ION EXCHANGE RESIN, CHEMICAL STABILITY, FORMALDEHYDE,  
RESORCINOL, ALCOHOL, POLYMER, THIOUREA  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1997/0727 STEP NO--UR/0080/70/043/004/0851/0854  
CIRC ACCESSION NO--AP0119634  
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119634

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE REPRODUCIBILITY OF REDOX CAPACITY OF FIBROUS ELECTRON EXCHANGE POLYMERS CONTG. QUINOID OR SULFHYDRYL GROUPS WAS DETD. BY CYCLIC REDOX TREATMENTS (REDN. BY NA BUS2 S SUB2 O SUB4 AND OXIDN. BY DIL. H SUB2 SO SUB4 CONTG. FECL SUB3), AND THE CHEM. STABILITY OF THOSE CONTG. QUINOID GROUPS WAS IMPROVED BY SUPPLEMENTARY TREATMENT WITH HCHO RESORCINOL MIXTS. (A). THE ELECTRON EXCHANGE CAPACITY (WHICH WAS REDUCED FROM CYCLE TO CYCLE) OF CELLULOSE HYDRATE AND POLY(VINYL ALC.) (I) WAS IMPROVED BY GRAFTING WITH A POLYCONDENSATE OF HCHO, PYROGALLOL, AND RESORCINOL, BUT THE ELECTRONIC EXCHANGE RATE WAS REDUCED BECAUSE OF STERIC OBSTRUCTION TO DIFFUSION BY THE CROSSLINKED STRUCTURE. SUBSEQUENT TREATMENT WITH A GAVE POLYMETHYLENE RESORCINOL CROSSLINKS, WHICH IMPROVED THE KINETIC ELECTRON EXCHANGE AND CHEM. STABILITY OF I-HCHO-PYROCATECHOL AND I-HCHO-PYROGALLOL GRAFT COPOLYMERS. THE REDOX CAPACITY OF SULFHYDRYL-CONTG. POLYMERS BASED ON ET XANTHATE OR THIUREA WAS DECREASED LITTLY ON CYCLIC REDOX TREATMENT EVEN WITH HEATED OXIDIZING SOLNS. FACILITY: LENINGRAD. INST. TEKST. LEGK. PROM. IM. KIROVA, LENINGRAD, USSR.

UNCLASSIFIED

Acc. Nr.

AP0048801

Abstracting Service:  
CHEMICAL ABST.

5-90

Ref. Code

UR00804

90947c Ir-spectroscopic studies of a vinyl alcohol-N-vinylpyrrolidinone copolymer. Savitskaya, A. N.; Klimenko, I. B.; Efremova, T. B.; Vol't, L. A.; Meos, A. I. (USSR). *Zh. Prikl. Khim. (Leningrad)* 1970, 43(1), 213-14 (Russ). A study of the ir spectra of poly(vinyl alc.), poly(N-vinylpyrrolidinone), and the title copolymer (I) indicated that some lactam rings are opened during synthesis of I. Thus, an intense band at  $1570\text{ cm}^{-1}$  in the spectrum of I was assigned to  $\text{RCO}_2$ , arising via cleavage of the lactam rings. This assignment was confirmed by potentiometric titrn.

DBJR

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REEL/FRAME

19800564

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Acc. Nr:

AP0049792

Abstracting Service:

CHEMICAL ABST. 5-70

Ref. Code:

48 0183

101747r Modification of poly(vinyl chloride) fibers by alkyl-chlorosilanes. Vol'f, I. A.; Besprozvannykh, A.; Podlesskaya, N. K.; Klimenko, I. B.; Shelkunov, N. G.; Grachev, V. I. (USSR). *Khim. Volokna* 1970, (1), 76-7 (Russ). Poly(vinyl chloride) (I) fibers were given water repellency by dehydrochlorination in the presence of FeCl<sub>3</sub> or diazoaminobenzene (II) catalyst followed by treating with Me<sub>3</sub>SiCl (III), Me<sub>2</sub>SiCl<sub>2</sub> (IV), or MeSiCl<sub>3</sub> (V) to give modified I having increasing Si content with increasing double bond content and amt. of Cl in the silanes. I fibers were dehydrochlorinated in the free state with 6% II and alc. by heating 18-20 hr at 90-100° or in the fixed state at 130° for 10-18 hr with II or 0.5-1 hr with 20% FeCl<sub>3</sub> soln. After removing from the catalyst bath (with bath ratio 40) and drying to 3-7% catalyst add-on, the fibers were impregnated with the silanes, e.g. with a bath contg. 2-10% V (bath ratio 30) for 10-15 min at 20°; heated in air 2-5 hr at 90-130°; extd. for 1 day with benzene, and washed 5 times with H<sub>2</sub>O or 1.5 times with steam to give I with 0.2-2% Si. Si content increased with increasing silane concn. in the bath, temp., and length of treatment. Although V gave the highest Si content, V gave the best water repellency as deld. by contact angle measurements. Si addn. to I was by Si-O-C bonds as well as by Si-C bonds. BCJR

REEL/FRADE

19801714

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VITUL'SKAYA, N. V., VOL'F, L. A., GILLER, S. A., YEGOROV, B. A., KOTETSKIY, V. V., PLOTKIN, L. L., and YANOVSKAYA, N. B., Leningrad Institute of Textile and Light Industry imeni S. M. Kirov; Institute of Organic Synthesis, Academy of Sciences Latvian SSR

"New Fibers for Medical Use"

Riga, Fiziologicheski i Opticheski Aktivnyye Polimernyye Veshchestva, "Zinatne," 1971, pp 145-149

Abstract: In order to increase the X-ray contrast effect of surgical suture materials, films and fibers were prepared from aqueous solutions of polyvinyl alcohol (PVA) with addition of barium sulfate in various concentrations (0.5-20%). The best contrast was obtained with 150  $\mu$  PVA film containing 10 and 20 BaSO<sub>4</sub>. A lower dose (1%) of BaSO<sub>4</sub> did not produce desired results. Sutures were prepared from PVA with admixture of polyformaldehyde, BaSO<sub>4</sub>, barium chloride, and collargol. The prepared fibers were thermostabilized at 220°C for 10 min and acetylated in water bath containing 20%  $\beta$ -(5-nitro-furyl-2)-acrolein and 20% H<sub>2</sub>SO<sub>4</sub> at 70°C for 2 hrs. The ready to use fibers were mechanically strong, stable in hot water (boiling for 1 hr produced only 10% shrinkage), and possessed high antimicrobial properties, especially toward

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VITUL'SKAYA, N. V., et al., Fiziologicheski i Opticheski Aktivnyye Polimernyye Veshchestva, "Zinatne," 1971, pp 145-149

Staphylococcus aureus, Escherichia coli, Trichophyton group, and other bacteria. Good results were obtained with polyformaldehyde fibers with 5 and 10% BaSO<sub>4</sub>, PVA with iodine-containing organic compounds. The obtained fibers were used for the manufacturing of such surgical materials as sutures, cotton, nets, contraceptive devices, etc., which presently are undergoing medical testing.

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USSR

VOL'F, L. A., GILLER, S. A., KOTETSKIY, V. V., MEOS, A. I., PLOTKIN, L. L.,  
and VITUL'SKAYA, N. V., Leningrad Institute of Textile and Light Industry  
imeni S. M. Kirov; Institute of Organic Synthesis, Academy of Sciences  
Latvian SSR; Leningrad Sever Manufacturing Society

"Antimicrobial Fibers Produced From Compounds of Nitrofurane Series"

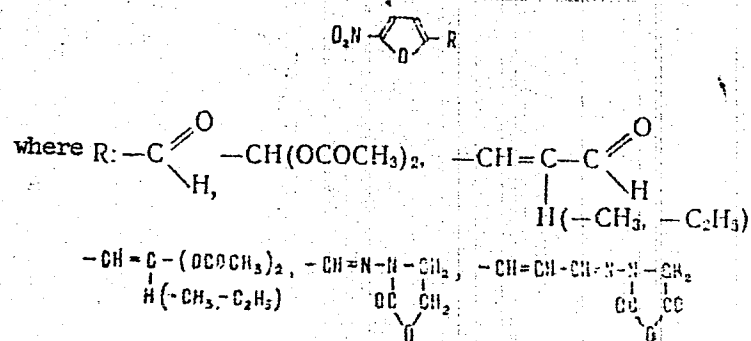
Riga, Fiziologicheski Opticheski Aktivnyye Polimernyye Veshchestva, "Zinatne,"  
1971, pp 150-154

Abstract: Acetylation of polyvinyl alcohol (PVA) fibers with aldehydes of  
5-nitrofurane series resulted in fibers capable of producing covalent ionic  
bonds, or coordination linkage between medicinal substances and polymers. The  
nitrofurane compounds used in this work had the following chemical structure:

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VOL'F, L. A., et al., Fiziologicheski i Opticheski Aktivnyy Polimernyye Veshchestva, "Zinatne," 1971, pp 150-154



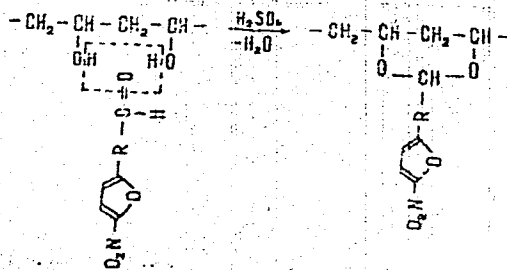
Among all compounds tested, 5-nitrofurfural (NF),  $\beta$ -(5-nitrofuryl-2)-acrolein (NFA), and their acetates such as furazolidone and furagin were of greatest interest. The acetylation of PVA fibers with aldehyde of 5-nitrofuran series is based on the ability of functional groups of polymer to react with carbonyl groups and to form acetylcyclobuthyleneglycol-1,3 links according to

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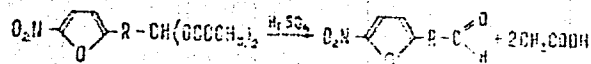
- 88 -

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VOL'F, L. A., et al., Fiziologicheski i Opticheski Aktivnyy Polimernyye Veshchestva, "Zinatne," 1971, pp 150-154



In the case of acetates the reaction proceeds as



The substitution extent of hydroxyl groups of PVA was 18-25 mole % under optimal acetylation conditions. The obtained fibers were mechanically strong, stable to sterilization by boiling, contained numerous capillaries, and possessed high antimicrobial activity. More than 28% of the antibacterial substances could be incorporated into fibers. Experiments with a natural

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VOL'F, L. A., et al., Fiziologicheski i Opticheski Aktivnyy Polimernyye Veshchestva, "Zinatne," 1971, pp 150-154

cellulose were not very successful. Only cellulose esters were capable of reacting with aldehyde of 5-nitrofuran compounds and forming useful fibers. Compounds of 5-nitrofuran series were incorporated into polyamide, polyester, polyformaldehyde, and polypropylene fibers during their molding. The obtained fibers possessed high antibacterial properties along with good mechanical properties. All of the fibers can be used for sutures, blood vessel substitutes, contraceptive devices, and for other medical uses.

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USSR

POZDNYAKOV, V. M., VOL'F, L. A., YEFREMOVA, T. B., and MEOS, A. I., Leningrad Institute of Textile and Light Industry imeni S. M. Kirov

"Preparation of Fibers for Medical Use From Copolymers of Vinyl Alcohol and Vinylpyrrolidone"

Riga, Fiziologicheskii i Opticheskii Aktivnyye Polimernyye Veshchestva, "Zinatne," 1971, pp 155-158

Abstract: The aim of this work was to prepare fibers capable of absorbing antibacterial preparations and prolonging their release in the human body. It was hypothesized that the presence of the polyvinylpyrrolidone chains in such fibers would improve the desirable properties of the prepared materials. Polyvinyl alcohol (PVA) and polyvinylpyrrolidone (PVP) were used for this purpose. Several methods for the preparation of materials with antimicrobial properties were tried. One of them was molding a mechanical mixture of 15 and 20% solutions of PVA and PVP in ratios of 90:10 and 70:30, respectively. The molding was carried out in the sodium sulfate bath (400 g Na<sub>2</sub>SO<sub>4</sub>/liter), followed by stretching the prepared fibers in air. When water-soluble fibers were desirable, they were washed free of Na<sub>2</sub>SO<sub>4</sub> in acetone. The initial ratio of PVA and PVP remained unchanged in the prepared product. The second method used

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POZDNYAKOV, V. M., et al., Fiziologicheski i Opticheski Aktivnyye Polimernyye Veshchestva, "Zinatne," 1971, pp 155-158

was the copolymerization of PVA and PVP. The copolymerization was carried out successfully in ethanol, benzene, or ethyl acetate (10-50% with respect to weight of monomers). The obtained product always contained the vinylpyrrolidone chains regardless of the initial ratio of starting compounds. However, copolymerization in benzene produced the best results. Copolymerization by the emulsion method was also tried. Fibers from spinning solution (25-30%) were also prepared by molding, followed by stretching in air, drying, and washing in alcohol. This method yielded fibers with good physical and mechanical properties. They were soluble in water at room temp. in 1 hr, but the solubility time could be prolonged by thermostabilization of fibers in air. All fibers produced by the above methods are undergoing testing at medical institutions.

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USSR

VOL'F, L. A., YEMETS, L. V., KONEV, Yu. Ye., KOTETSKIY, V. V., MEOS, A. I.,  
and KHOKHLOVA, B. A., Leningrad Institute of Textile and Light Industry imeni  
S. M. Kirov; Leningrad Scientific Research Institute of Antibiotics

"Preparation of Physiologically Active Fibers With Ion-Fixed Preparations"

Riga, Fiziologicheskii i Opticheskii Aktivnyye Polimernyye Veshchestva,  
"Zinatne," 1971, pp 159-165

Abstract: Sorption of colimycin, novocainamide, and brilliant green by modified polyvinyl alcohol (PVA) fibers containing sulfo and carboxyl functional groups was studied, with the aim of preparing physiologically active materials with antimicrobial, anti-inflammatory, and anesthetic properties. The best sorption of brilliant green and novocainamide took place on fibers with -COOH group in the salt (Na) form. The carboxyl group in H-form dissociated very little in acid solutions, but the same group in the salt (Na) form was ionized in a wide pH range. Similar results were obtained with colimycin. The sulfo group dissociated equally well in all media. Therefore, there were no significant differences in sorption of the above preparations on sulfoexchangers either in acid or salt form. Excess of preparations (1-1.5 fold) in solution and larger absorbing surface of fibers were of importance. A difference in  
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VOL'F, L. A., et al., Fiziologicheski i Opticheski Aktivnyye Polimernyye Veshchestva, "Zinatne," 1971, pp 159-163

the sorption rate of the above preparations by fibers with carboxyl groups in H- or salt (Na) form is attributed to a greater swelling of the salt exchanger (Na especially) in comparison with H-form. In experiments with animals it was shown that presence of an ionic bond between fibers and medicinal preparations makes the textile material more stable toward bacteria, as opposed to ordinary impregnation of fibers with antibiotics. Catgut and natural silk treated with colimycin preserved their antimicrobial properties 8 days after their presence in soft tissues of rabbits. This is attributed to the formation of electrovalent and hydrogen bonds between antibiotics and peptides.

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USSR

UDC: 621.396.6.017.72

VITKHEIN, A. D., VOL'F, Ye. M.

"A Method of Studying the Stationary Temperature Field of an Object in a Vacuum"

USSR Author's Certificate No 259496, filed 14 Jul 67, published 20 May 70  
(from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V281 P)

Translation: This Author's Certificate introduces a method of studying the stationary temperature field of an object in a vacuum by modeling the object and measuring its temperatures. The scope for such studies is extended by placing a model which is geometrically similar to the object in a vacuum chamber, shielding it from the walls of the chamber by a heat-absorbing screen, and altering the radiation heat transfer to the model in inverse proportion to the change in linear dimensions of the object by creating the necessary temperature differential between the model and the heat-absorbing screen. Ye. M.

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VOL'FINZON, Ya. G.

SO: JPRS 54018  
9 SEP 71

UFG: 616-073, 75:362, 12 (47-21)

SOME PROBLEMS PERTAINING TO ROENTGENOLOGICAL SERVICES TO THE URBAN POPULATION IN POLYCLINICS

NY - Public Health

(Article by Ya. G. Vol'finzon, Inst. Pulmology, Chair of Social Hygiene and Public Health, Leningrad Medical Institute, Leningrad; Institute for the Advanced Training of Physicians (Inst. V.V. Kirov, Moscow, U.S.S.R.; Leningrad, Russia), No 7, 1971, submitted 14 January 1971, pp 48-51)

The roentgenological method of examination occupies a prominent place in the diagnosis of a number of diseases. At the present time about 25 percent of all diagnoses are made with its use (I. G. Lagunova, 1960).

Roentgenology is of inestimable importance in the detection of such diseases as tuberculosis, cancer, and inflammatory processes. Yet its role is more modest with reference to identification of acute respiratory infections, influenza, acute bronchitis, and others. Some clinicians are not sufficiently acquainted with the indications and capabilities of roentgenology and often refer patients for x-rays when the diagnosis in such that roentgenology does not yield any positive results while the patient is unjustifiably exposed to ionizing radiation. In this connection we cannot help but agree with S. A. Rybnikov (1950) that the hazard of the examination should be rationally consistent with the expected benefit. But a simple fluoroscopy or x-ray should be taken without substantiated indications.

We investigated the justification of referrals of polyclinic patients for x-rays and also analyzed the conditions of clinical diagnosis and roentgenological findings on these patients. This study was pursued at the 37th polyclinic of Frunzenskiy Rayon of Leningrad, which is one of the large polyclinics in the city connected with a hospital. There is a traumatology center at the polyclinic. The x-ray department consists of three diagnostic, a roentgenospectroscopic, and a fluoroscopic examination rooms. It has been the practice of the department to provide for 6.5 posts of roentgenologist. The size of the population serviced by the polyclinic numbers 90,000 people, with 37,609 males (41.1 percent) and 52,390 females (58.9 percent).

Public Health

1/2 019 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--FORMATION OF KOP SUB3 .MOD SUB3 -U-  
AUTHOR--(03)-VOLFKOVICH, S.I., KUBASOVA, L.V., KOZMINA, M.L.  
COUNTRY OF INFO--USSR  
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(5), 1101-2  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--X RAY ANALYSIS, PAPER CHROMATOGRAPHY, POTENTIOMETRIC  
TITRATION, POTASSIUM COMPOUND, PHOSPHATE, MOLYBDENUM OXIDE, PHASE  
EQUILIBRIUM  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3002/1275 STEP NO--0R/0020/70/190/005/1101/1102  
CIRC ACCESSION NO--AT0128689  
UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0128689

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PHASE EQUIL. IN THE SYSTEM FORMED BY MO(VI) OXIDE AND K POLYMETAPHOSPHATE WERE STUDIED. K POLYMETAPHOSPHATE IS OBTAINED BY THE DEHYDRATION OF K ORTHOPHOSPHATE AT 450DEGREES FOR A PERIOD OF ONE HR. THE AV. D.P. BY THIS METHOD IS 130 ATOMS OF P PER CHAIN AS DETD. BY POTENTIOMETRIC TITRN. IN A SOLN. OF NANO SUB3. THE CRYSTD. MELT OF (KPO SUBE) SUBN AND MOO SUB3 IS INVESTIGATED BY MEANS OF DTA UP TO 1000DEGREES AT A HEATING RATE OF 3.5 DEGREES-MIN. THE RESULTS INDICATE THE FORMATION OF A COMPO. OF COMPN. KOP SUB3 .MOO SUB3 WITH A M.P. OF 772DEGREES AND HAVING 2 EUTECTICS, AT 676DEGREES (15 MOLAR PERCENT MOO SUB3) AND 603DEGREES (67.5 MOLAR PERCENT MOO SUB3). ANAL. OF THE INDIVIDUAL PHASES AND THE GENERAL PHASE COMPN. IS CONDUCTED BY X RAY DIFFRACTION AND POINTS TO A CUBIC STRUCTURE WITH ALPHA EQUALS 13.50 ANGSTROM. PAPER CHROMATOGRAPHIC STUDIES SHOW THE PRESENCE OF A LARGE AMT. OF THE TETRAMETAPHOSPHATE ANION. FACILITY: MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 CC9 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--UREA PHOSPHATES AND THEIR POSSIBLE USE IN ANIMAL HUSBANDRY --U-  
AUTHOR--(03)--VOLFKOVICH, S.I., CHEKHOVSKIKH, A.I., MIKHALEVA, T.K.  
COUNTRY OF INFO--USSR ✓  
SOURCE--KFIH. SEL. KHOZ. 1970, 8(3), 217-18  
DATE PUBLISHED--70  
  
SUBJECT AREAS--AGRICULTURE, BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--UREA, PHOSPHATE, ANIMAL HUSBANDRY, DIET, COMMERCIAL ANIMAL  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3001/0514 STEP NO--UR/0394/70/008/003/0217/0218  
CIRC ACCESSION NO--AP0126262  
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0126262

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE UTILIZATION OF CO(NH SUB2) SUB2.H SUB3 PO SUB4 (I), CO(NH SUB2) SUB2.H SUB4 P SUB2 O SUB7 (II), AND NCO(NH SUB2) SUB2.(HOP SUB3) SUBN (III) IN RUMINANT FEED WAS STUDIED. THE USE OF I, II, AND III IN SHEEP FEEDING TRIALS PRODUCED BETTER RESULTS THAN UREA. THE HANDLING OF I, II, AND III WAS SIMILAR TO UREA HANDLING, BUT THEIR TENDENCY FOR CAKING IN STORAGE WAS CONSIDERABLY LOWER. THE WATER SOLN. OF I HAD A PH OF 1.5-3.15, A GOOD PROPERTY FOR USE IN THE PRESERVATION OF SILAGE.

UNCLASSIFIED

104437a. Hydrolysis of potassium metaphosphate. Vol'f-  
 kovich, S. I.; Cherepanova, A. S.; Grishina, I. A. (USSR).  
 Zh. Prikl. Khim. (Leningrad) 1970, 43(1), 3-9. (Russ). The acid  
 hydrolysis of the polymeric  $(KPO_3)_n$  was a 1st order reaction and  
 proceeded from the end of the chain. The primary intermediates  
 were orthophosphate and trimetaphosphate. The rate of hy-  
 drolysis increased with increasing temp. and decreasing pH; at  
 pH = 2.75, the rate consts. were:  $K_{10} = 0.82 \times 10^{-1} \text{ min}^{-1}$ ,  
 $K_{25} = 0.25 \times 10^{-1} \text{ min}^{-1}$ , and  $K_{75} = 0.59 \times 10^{-1} \text{ min}^{-1}$ .  
 The half life of  $(KPO_3)_n$  in acidic media at 50, 65, and 75° was  
 14.1, 4.8, and 1.9 hr, resp. and the activation energy for the acid  
 hydrolysis was 18,000 cal. The results of this investigation  
 could be correlated to the agrochem. data for the rate of conver-  
 sion of K metaphosphate into orthophosphate on various soils.  
 G. Melamed

REEL/FRAME  
 19791221

1876

Acc. Nr:

AP0047647

Abstracting Service:

CHEMICAL ABST. 5/70

Ref. Code:

UR 0080

✓  
104437a Hydrolysis of potassium metaphosphate. Vol'f.  
kovich, S. I.; Cherepanova, A. S.; Grishina, I. A. (USSR).  
Zh. Prikl. Khim. (Leningrad) 1970, 43(1), 3-9. (Russ). The acid  
hydrolysis of the polymeric (KPO)<sub>n</sub> was a 1st order reaction and

Electrochemistry

USSR

UDC 541.13

PIS'MEN, L. M., KUCHANOV, S. I., VOL'FKOVICH, Yu. M., GORYACHEV, R. G., and BOGOTSKIY, V. S., Institute of Electrochemistry, Academy of Sciences USSR, Moscow

"Large Scale Macrokinetics of a Hydrogen-Oxygen Fuel Cell With a Capillary Membrane"

Moscow, Elektrokimiya, Vol 9, No 9, Sep 73, pp 1262-1271

Abstract: Mass exchange calculations are reported for a hydrogen-oxygen fuel cell with a capillary membrane, considering the diffusion of ions and water in the liquid state, diffusion of gasses and vapor, filtration stream of the solution, convectional stream of the gaseous mixture, ion migration, stoichiometry and microkinetics of the anode and cathode reactions. The functions of the cell in respect to the basic construction and regimen parameters have been calculated.

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USSR

UDC 621.352.5

VOLINKOVICH, YU. M., and SOSENKIN, V. YE., Institute of Electrochemistry,  
Academy of Sciences USSR, Moscow.

"Distribution of Electrolyte Concentration Across the Electrochemical Group  
of a Hydrogen-Oxygen Fuel Cell With a Capillary Membrane"

Moscow, Elektrokimiya, Vol 8, No 7, Jul 72, pp 1034-1037

Abstract: Calculations were carried out of the distribution of electrolyte concentration across the electrode as a function of two most common work regimens: intrakinetic and internally accelerated-ohmic regimes. Within the membrane this function, under the first regimen, bends slightly towards lower  $c_y$  values. At the border points of the membrane the slope of  $c_y(y)$  curve increases sharply and finally at the edge of the electrochemical group the increase in  $(c_y)_{O_2}$  decreases gradually, and the decrease of  $(c_y)_{H_2}$  becomes slower, because in contrast to the membrane, the integral current in electrodes drops to zero with the approach toward the external surface. In case of the internally accelerated-ohmic work regimen, the intraohmic energy losses result in an irregular distribution of the differential current density across the porous electrode.

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USSR

UDC 621.316.842

SERYAKOV, N. N., YEROFEEVA, L. A., VOL'FNEUK, M. G., YURITSYN, L. V.

"A Method of Making MLT Resistors"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 36, Soviet Patent No 288089, class 21, filed 5 Aug 68, published 3 Dec 70, p 68

Translation: This Author's Certificate introduces a method of making MLT resistors. As a distinguishing feature of the patent, the reliability of the resistors is improved by selecting resistors in which the level of the noise emf is no more than 0.25  $\mu\text{V/V}$  and giving them secondary pulse treatment.

1/1

- 15 -

1/2 016 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--RESTORATION OF AUTOMATIC COUPLINGS BY MECHANIZED BUILDING UP -U-

AUTHOR--(03)--VOLFOVSKAYA, F.S., GUTMAN, L.M., EPSHTEYN, S.S.

COUNTRY OF INFO--USSR

SOURCE--AVTONAT. SVARKA, FEB. 1970, (2), 52-54.

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--METAL SURFACING, WELD FACING, LOCOMOTIVE, RAILWAY ROLLING  
STOCK, MECHANICAL COUPLING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PRGXY REEL/FRAME--2000/0316

STEP NO--UR/0125/70/000/002/0052/0054

CIRC ACCESSION NO--AP0124075

UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124075

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN IMPROVED BUILDING UP TECHNOLOGY FOR RESTORING WORN PARTS OF THE AUTOMATIC COUPLINGS OF RAILWAY WAGONS AND LOCOMOTIVES IS DESCRIBED. THE BUILDING UP PROCESS IS FULLY MECHANIZED; IT IS CARRIED OUT UNDER FLUX OR WITH A POWDER WIRE, WITHOUT ANY SUPPLEMENTARY PROTECTION FROM THE EFFECTS OF THE ATMOSPHERE. A SLIGHT DEGREE OF MECHANICAL FINISHING MAY BE REQUIRED AFTER THE BUILDING UP OPERATION.

UNCLASSIFIED

Public Health, Hygiene and Sanitation

USSR

UDC 621.373.826:57

KIRICHINSKIY, B. R., SHEPELEV, V. N., MEDVEDOVSKAYA, TS. P., LYSINA, G. G.,  
LOGANOVSKIY, N. G., SOLETSKAYA, A. S., VOL'FOVSKAYA, R. KH.

"Effect of Laser Emission on the Organism of Industrial Workers"

V sb. Ispol'z. optich. kvant. generatorov v sovrem. tekhn. i med. Ch. 2-3  
(Utilization of Lasers in Modern Engineering and Medicine, Parts 2-3 -- collec-  
of works), Leningrad, 1971, pp 108-110 (from RZh-Radiotekhnika, No 1, 1972,  
Abstract No 1D651)

Translation: A report is presented on examination of 40 people working 3.4 years on the average with laser emission (200-200 bursts per week with a pulse duration of 20-40 nanoseconds and an energy of 1-10 joules and up to 1 joule in the continuous mode). It was calculated that the radiation level on the cornea was  $5 \cdot 10^{-6}$ - $5 \cdot 10^{-7}$  joules, which is approximately 2 orders higher than the levels which the majority of authors recommend as the maximum allowable and approaches the threshold values (causing minimum damage to the retina). For people with low seniority, pronounced shifts in autonomic vascular regulation was often detected with some lowering of visual function and liability of composition of peripheral blood. This has the form of functional-dynamic shifts.

1/1

Beryllium

USSR

UDC: 620.193.01

VOL'FSON, A. I., MARKOVA, N. Ye., CHERNYSHEV, V. V., LEBEDEV, V. N., PABA-  
KIN, V. V.

"Some Electrophysical Characteristics of Anodic Films on Beryllium"

Moscow, Zashchita Metallov, Vol 9, No 3, May/Jun 73, pp 346-347

Abstract: The electrophysical properties of anodic oxide on beryllium were studied by measuring breakdown voltage and capacitance. Beryllium specimens in the form of discs had threaded holes in the lateral surface for screwing in V95 aluminum alloy conductive rods insulated by a mixture of wax and resin. Before anodizing, the specimens were degreased and then oxidized in a 20% aqueous solution of  $\text{CrO}_3$ . Current density was  $20 \text{ A/dm}^2$ , and temperature was  $20^\circ\text{C}$ . The resultant films had a thick porous outer layer and a thin barrier on the metal side. Film capacitance was measured in the same solution. a Teflon ring was pressed against the porous surface layer and filled with mercury. High surface tension kept the mercury from filling the pores in the film. In the resultant capacitor, the air in the pores and the film oxide served as the dielectric. The capacitance was determined by the total thickness of the oxide film. The results of these

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USSR

VOL'FSON, A. I. et al., Zashchita Metallov, Vol 9, No 3, May/Jun 73, pp 346-347

measurements show that film thickness remains essentially constant with time. Measurements of the critical breakdown voltage of the film confirmed the capacitance measurements. Thick films formed over a 3-4 hour period can withstand voltages up to 1000 V.

2/2

USSR

UDC 621.357.8:669.725(088.8)

VOL'ESOV, A. I., UMOV, V. S., POLONSKIY, E. L., MARKOVA, N. Ye.,  
CHERNYSHOV, V. V., LEBEDEV, V. N.

"Method of Anodization of Beryllium and Its Alloys"

USSR Author's Certificate No 305210, Filed 5/02/70, Published 13/07/71,  
(Translated from Referativnyy Zhurnal, Khimiya, No 2, 1972, Abstract No  
2 L241 P from the Resume).

Translation: A method of anodization of beryllium and its alloys in an  
electrolyte containing  $H_3BO_3$ , differing in that in order to increase the  
corrosion resistance of the film, ethylene glycol and ammonia are intro-  
duced to the electrolyte in the following relationship (g/l): ethylene  
glycol 50-150,  $H_3BO_3$  30-160, 25% ammonia solution, ml 40-100, and the pro-  
cess is conducted at 10-40°,  $D_c$  0.2-2 a/dm<sup>2</sup>.

1/1

USSR

UDJ 621.385.64.072.9:621.391.822.3

SOBOLEV, G.L., VOL'FSON, A.O., IL'IN, V.K.

"Fluctuations In Synchronized And Stabilized Voltage-Tuned Magnetrons"

Radiotekhnika i elektronika, Vol XVII, No 5, May 72, pp 1039-1045

Abstract: Analytical expressions are found for the spectrum of the output oscillations of a voltage-tuned magnetron (VTM) which is synchronized by an exterior signal and stabilized by a high-Q resonator. The relationships obtained in the work make it possible to calculate the spectra of the fluctuations of the amplitude and phase and the spectrum of the high-frequency oscillation of a VTM for regimes of synchronization and stabilization with the existence of shot noise. The spectra of the fluctuations for a stabilized VTM implies the possibility of reducing noise in all regions of the spectrum of the output oscillations of a VTM. 2 fig. 12 ref. Received by editors, 8 April 1971.

1/1

USSR

UDC: 621.317.79:621.376(088.8)

VOL'FSON, A. V.

"A Device for Measuring Percentage Modulation"

USSR Author's Certificate No 265964, filed 29 Jul 68, published 1 Jul 70  
(from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2A400 P)

Translation: This Author's Certificate introduces a device for percentage modulation measurement which contains a receiver, pulse modulator with controllable frequency modulation and a registration device. As a distinguishing feature of the patent, the proposed device is designed for measuring partial percentage modulation with simultaneous improvement of measurement precision. This is accomplished by connecting the modulator output to the registration device through a narrow-band filter. E. L.

1/1

USSR

UDC: 621.317.773(088.8)

VOL'FSON, A. Ye. and AGINSKAYA, S. T.

"Device for Forming Two Sinusoidal Voltages with Controllable Phase Shift"

Avt. sv. SSSR (Author's Certificate USSR) class 21e, 36/03, (G 01 r) no. 272428, Application, 5.05.68, Publication 11.09.70 (From RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3A350P)

Translation: A device is proposed for the formation of two sinusoidal voltages with controllable phase shift, containing a pulse generator, a frequency divider, gating stages, and filters. The device is distinguished in that, to improve the accuracy and stability of the output voltage phase shift, a storage element such as a capacitance is connected to the output of each gating stage, while the gating stage inputs are interconnected through a precision time delay circuit. E. L.

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USSR

UDC 624.07.04:534.1

VOL'FSON, B. P., Moscow

"Wave Propagation in Models of Buildings and Structures With Internal Friction"

Podol'sk, Stroitel'naya mekhanika i raschet sooruzheniy, No. 5, 1971, pp 12-19

Abstract: Problems of the propagation of longitudinal, transverse and torsional waves in one-dimensional stepped-periodic systems are discussed. These systems were shown in previous articles by the author to be good models for modern buildings and structures of medium and higher height and the absence of internal friction was assumed. In this article these solutions previously obtained are extended to systems with internal friction. In studying wave propagation in periodic and stepped-periodic systems, wave reflection and refraction at the edges and in the zones of contact of the lattices are first considered. The behavior of the waves, whether incident, transmitted or reflected, is examined at the point of contact of two lattices and the coefficients of transmission and reflection of the amplitudes at the point of contact are used to determine two relationships, one of which is the condition for the absence of energy losses at the point of contact of the lattice. The energy flows are related to the

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USSR

VOL'FSON, B. P., Stroitel'naya mekhanika i raschet sooruzheniy, No. 5, 1971, pp 12-19

characteristic impedances of the lattices and to such characteristics as average energy density and rate of energy propagation. Expressions are found for the several values characterizing the propagation of waves in the lattice and the expression for the energy flows is then written. Internal friction in which there is interaction only between neighboring masses is taken into account in the system. The expressions obtained may be used to determine the entire process of the propagation of longitudinal, transverse, or torsional waves in a system with internal friction in a modern building or structure from the time of the rise of the wave up to any point of time of interest. The practical use of the results is illustrated in a sample calculation of a ten-story frame building. A comparison of these results with calculations of the same system without considering internal friction shows that the amplitude of the resulting wave in the system with internal friction is less after 0.97 sec than the amplitude of the resulting wave in the corresponding points of the system without internal friction by 20-30%. Consideration of internal friction effects the coefficients of reflection and refraction of the waves at the ends and at the point of contact of the lattices even more than it effects the wave amplitude.

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USSR

UDC: 621.396.69:621.316.826

AFANAS'YEV, B. K., VOL'FSON, I. P., KARACHENTSEV, A. Ya., PEL'TSMAN, I. D.,  
POMUKHIN, N. P., CHERTYAVSKIY, Yu. M.

"Experience in Developing an Automated Production Line for SN1-1-1 Varistors"

Elektron. tekhnika. Nauchno-tekhn. sb. Tekhnol. i organiz. proiz-va (Electronic Technology. Scientific and Technical Collection. Technology and Organization of Production), 1970, vyp. 4 (36), pp 3-10 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V412)

Translation: The authors describe a line which excels the level of the best known models in its technological characteristics, level of automation and the number of operations performed. The principle of unification was extensively utilized in designing the line. The line is equipped with a system for accumulating and processing data on the course of the technological process. Resumé.

USSR

UDC 621.165.533.6

ZIL'BERMAN, A. S., Candidate of Technical Sciences, LOPATITSKIY, A. O., Candidate of Technical Sciences, NAKHMAN, Yu. V., Candidate of Technical Sciences, VOL'FSON, I. M., Engineer, OZERNOV, I. A., Engineer, and PAKHOMOV, V. A., Engineer, Leningrad Metal Plant, Higher Technical Educational Institution at Leningrad Metal Plant

"Additional Energy Losses Through Periodical Unsteadiness of the Flow in Rotor Blades of Turbine Stages"

Moscow, Teploenergetika, No 10, Oct 73, pp 55-59

Abstract: The quantitative coupling of additional unsteady profile losses of energy in rotor blades with normal operation turbine stage parameters was experimentally investigated on stage models with more than twenty combinations of nozzle and rotor lattices of various types. A complex of factors affecting the change of profile energy losses in rotor lattices was analyzed. Based on generalized experimental data, a functional dependence of additional unsteady profile losses in rotor lattices ( $\Delta \xi_r$ ) on a derived criterion of unsteadiness (Y) is suggested. The

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USSR

ZIL'BERMAN, A. S., et al., Teploenergetika, No 10, Oct 73, pp 55-59

function  $\Delta \xi_p = F(Y)$  for all investigated stages is shown with and without accounting for deviations from the calculated regime. The additional losses increase essentially (from ~0 to ~7.5 %) within the limits  $0.4 \cdot 10^{-2} < Y < 1.2 \cdot 10^{-2}$  and remain practically constant at further increase of  $Y$ . The derived functional dependence encompasses typical cases of stages of modern stationary turbines in the zone of moderate hub ratios. Two figures, one table, fifteen formulas, fourteen bibliographic references.

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- 114 -

1/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--ANALYSIS OF THE OPERATION OF THE CENTRAL GAS FRACTIONATION PLANT OF  
PLANT THE LOWER KAMA PETROCHEMICAL COMBINE -U-  
AUTHOR--(05)-VOLFSON, I.S., KONSTANTINOV, YE.N., KOZIN, V.A., DIMITRIYEV,  
A.P., ISLAMOV, SH.KH.  
COUNTRY OF INFO--USSR

SOURCE--NEFTEPERERAB. NEFTEKHIM. (MOSCOW) 1970, (2), 20-3

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--BUTANE, PROPANE, GAS, PETROCHEMISTRY, CHEMICAL PLANT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1514

STEP NO--UR/0318/70/000/002/0020/0023

CIRC ACCESSION NO--AP0118501

UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0118501

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN C SUB2 H SUB6 COLUMN INSTEAD OF A FRACTIONATION ABSORBER AND A LOWER COOLING WATER TEMP. REDUCED THE LOSSES OF THE C SUB3 H SUB8-C SUB4 H SUB10 FRACTION OF THE DRY GAS. THE OPERATING COSTS INCREASED WHEN A SIMILAR QUALITY LEVEL WAS OBTAINED WITH ANALOGOUS TEMP. AND PRESSURE IN THE FRACTIONATION ABSORBER. BUBBLE CAPS INSTEAD OF GRID PLATES IN THE DISTN. COLUMNS PROVIDED HIGHER AND STABLE PURITY OF THE FRACTIONS, THE EFFICIENCY OF THE FORMER BEING TWICE AS HIGH. THERMOSIPHON REBOILERS INSTEAD OF FURNACES FOR HEATING THE COLUMN BOTTOMS IMPROVED THE OPERATION CONTROL AND VERSATILITY.

UNCLASSIFIED

Acc. Nr:  
**AP0047386**

Abstracting Service:  
GEOPHYSICAL ABST.

Ref. Code:  
**570 2R0065**

V

91898z Udmurt petroleum. Vol'ison, I. S.; Telesheva, M. N.; Sheikh-Ali, G. A. (USSR). *Russk. Tekhnol. Topl. Masel* 1970, 15(1), 5-8 (Russ). The following properties of the title petroleum are reported: density, mgl. wt., viscosity at 20°, and at 50°, congelation, H<sub>2</sub>SO<sub>4</sub>, tar, paraffin, silica gel resins, asphaltenes, coke, fraction b. ≤200° and ≤300°, acidity, and C<sub>10-15</sub> hydrocarbons.  
GCJR

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g.  
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REEL/FRAME  
**19790912**

1/2 023 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--THERMODYNAMICS OF FORMALDEHYDE TRIOXANE POLYFORMALDEHYDE SYSTEM -U-  
AUTHOR--BERLIN, A.A., VOLESON, S.A., OLEINIK, E.F., ENIKOLOPYAN, N.S.  
COUNTRY OF INFO--USSR ✓  
SOURCE--VYSOKOMOL. SOEDIN. SER. A 1970, 12(2), 443-9  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--THERMODYNAMICS, IR SPECTRUM, FORMALDEHYDE, TRIOXANE,  
POLYFORMALDEHYDE  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1989/0245 STEP NO--UR/0459/70/012/002/0443/0449  
CIRC ACCESSION NO--AP0106901  
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106901

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE IR SPECTRA OF HCHO (G) AND TRIOXANE (G) (I) ARE DIFFERENT. IR SPECTROSCOPY WAS USED TO DET. THE RELATIVE AMTS. OF HCHO AND I IN THE VAPOR PHASE ABOVE SOLID POLYFORMALDEHYDE (II) IN THE 25-72DEGREES RANGE. FROM THE RELATIVE CONCNS., AND THE REPORTED THERMODYNAMIC PROPERTIES OF HCHO, I, AND II, THE THERMODYNAMIC PARAMETERS OF HCHO AND I POLYMN. WERE CALCD. THE ACTIVATION ENTHALPY, ENTROPY, AND FREE ENERGY ARE GIVEN OF SOLID OR LIQ. II FORMATION FROM LIQ. OR GASEOUS HCHO AND LIQ., GASEOUS, OR SOLID I.

UNCLASSIFIED

USSR

UDC 661.666,548.73:658.562

LUTKOV, A. I., VOIGA, V. I., and DYMOV, B. K.

"Methods of Determining the Average Size of Graphite Crystals in the Basal Plane"

Moscow, Zavodskaya Laboratoriya, Vol 39, No 10, Oct 73, pp 1201-1203

Abstract: Methods are described for determining the average size of graphite crystals in the basal plane. These methods are based on establishing the temperature relationships of thermal conductivity and resistivity. Measurement were made for isotropic, slightly anisotropic, anisotropic and high anisotropic grades of graphite with average size determined by both electrical and thermal measurements. The size of the crystals was determined by using a modified Debye equation and by the relationship between the average size of a grain and the temperature of minimum resistivity. Both methods yielded similar values for the different forms of graphite mentioned above. One table, nine bibliographic references.

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- 8 -

VOLGA, V.I.

RM/18.760/5.11.73  
Dec 73

Luikov, A. I., B. K. Zymay, and V. I. Volga.  
The relationship between thermal and electrical  
conductivities of graphite. 1. Izv. V. 22, no. 5,  
1972, 932. (Annotation).

An attempt to correlate thermal conductivity  $\lambda$  with  
electric resistivity  $\delta$  of graphite at high temperatures is described.  
Many researchers previously noted that the  $\lambda \times \delta$  product is  
constant to a certain degree, but only at room temperature.

Experimental  $\lambda$  and  $\delta$  data in the range 80 - 2,500°K  
range are given and the  $(\lambda \times \delta)$  values are calculated for artificial  
graphites with 1.0 - 2.26 g/cm<sup>3</sup> specific weights. At a low tempera-  
ture, the  $(\lambda \times \delta)$  of individual graphites varied significantly. At  
room temperature,  $(\lambda \times \delta)$  was nearly the same for the graphites  
studied. At  $T > 1,500^\circ\text{K}$ ,  $(\lambda \times \delta) = 0.34 - 0.38 \text{ V}^2/\text{degree}$  and is  
independent of temperature for all graphites studied with the exception  
of those with lowest (1.0 g/cm<sup>3</sup>) and highest (2.26 g/cm<sup>3</sup>) specific  
weights.

Voronin, V. I., and A. Ya. Blazhkov.  
Thermal boundary layer on a noniso-  
thermal plate. IVUZ Aviatsonnaya  
tekhnika, no. 1, 1972, 119-123.

The equation of energy of a compressible laminar  
boundary layer on a semi-finite plate with different local boundary  
conditions is analyzed. It is assumed that the  $0 \leq \xi \leq 1$  area of the  
leading edge, where  $\xi = x/l$  and  $\xi$  is the longitudinal coordinate,  
is cooled to a constant temperature  $T_{\text{co}}$  and its equation of energy  
is solved by the known Crocco integral. Using this integral and a

USSR

TAMARIN, P. V., BATDALOV, A. B., ~~VOLGA, V. I.~~, Institute of Semiconductors,  
Academy of Sciences of the USSR, Leningrad

"Effect of Alloying on Some Physical Properties of Graphite"

Leningrad, Fizika Tverdogo Tela, Vol 13, No 9, Sep 71, pp 2819-2821

Abstract: Data are presented on the effect which doping graphite with certain refractory elements has on electrical and thermal conductivity at temperatures from 2 to 2500°K. The effect of temperature and dopants on thermoelectromotive force is also investigated. It is found that the latter changes both in amplitude and sign with doping. Curves are given which show how this effect can be utilized in thermocouples using boron-doped and Zr+Si-doped graphite. The authors thank S. S. Shalyt for constant interest and for directing the work, and V. V. Popov for taking part in the measurements. Two figures, bibliography of two titles.

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Graphite

USSR

UDC: 621.3.035.2

LUTKOV, A. I., VOLGA, V. I., DYMNOV, B. K., DEMIN, A. V., RAKCHE-  
YEVA, V. I., and PERKOVA, G. A.

"Investigating the Effect of Refractory Elements on the Thermal  
and Electrical Conductivity of Graphite"

Moscow, Tsvetnyye Metally, No 8, Aug 70, pp 48-51

Abstract: The recent development of a method for graphite production involving thermomechanical processing under pressure has led to the diffusion of contaminants in the graphite. These contaminants react with the carbon to produce materials whose thermal and electrical conductivity characteristics are very sensitive to crystal structural defects caused by the contaminants. The purpose of this article was to investigate graphite obtained by this thermomechanical processing of coke into which refractory elements such as Ti, Si, Zr, and B, were introduced. The procedure for measuring the thermal and electrical conductivity in the temperature interval of 80-2500° K is the same as that used in an earlier paper written by the first-named of the authors above, in collaboration with others (Collection "Konstruktsionnyye materialy

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USSR

LUTKOV, A. I., et al., Tsvetnyye Metally, No 8, Aug 70, pp 48-51

na osnove grafita" -- Structural Materials Based on Graphite -- 4th edition, published by "Metallurgiya," 1965, p 59). A brief description of the thermomechanical procedure is given. The authors found that the heightening of the material's plasticity, the result of the interaction between the carbon and these refractory elements, affects the properties of the product. They found also that boron, which is a close neighbor of carbon in the periodic table and has a practically equal atomic radius, can replace the carbon in the graphite lattice. It was noted that the presence of boron promotes the graphitization process. Curves of the thermal and electrical conductivity of the graphite as functions of the temperature in the graphitization furnace, for various concentrations of the refractory elements, are given.

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Acc. Nr:

AP0049786

Abstracting Service:

CHEMICAL ABST. 5/70

Ref. Code:

UR. 0467

104713n Thermal conductivity, specific electrical resistance, and specific heat of compact graphites. Luktoy, A. I.; Volyn, V. I.; Dymov, B. K. (USSR). *Khim. Tverd. Topl.* 1970, (1), 132-43 (Russ). Thermal cond.,  $K$ , sp. elec. resistance,  $\rho$ , and the heat capacity of graphites of different  $d$ . were deid. at 50-2700°K. Graphite of  $d$ . 1.0 was isotropic, whereas that of  $d$ . 1.9 was anisotropic. The av. dimension,  $L$ , of crystallites and the anisotropy of  $K$ , were calcd. by the Debye equation,  $K_a = (1/4)cv_aL$ , where  $v_a$  is the velocity of phonons along the  $a$  axis.  $K$  increased with temp., passing through a max. at 175-290°K. The ratio of  $K_{\max}$ , perpendicular,  $K''$ , and parallel,  $K'$ , to the direction of compression,  $K'/K''$ , was 3.2 for graphite of  $d$ . 2.0 and 4.5 for graphite of  $d$ . 2.1-2.2. The plot  $\rho$  vs. temp. passed through a min. at 400-1150°K. The plot  $\log K$  vs.  $1/T$  consisted of intersecting lines. GBJR

REEL/FRAME  
19801704

1/2 027 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--METHODS FOR MEASURING THE THERMAL CONDUCTIVITY OF GRAPHITES -U-  
AUTHOR-(04)-LUTKOV, A.I., VOLGA, V.I., DYMOV, B.K., ANUFRIYEV, YU.P.  
COUNTRY OF INFO--USSR  
SOURCE--ZAVOD. LAB. 1970, 36(3), 295-8  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--GRAPHITE, THERMAL CONDUCTIVITY, MATERIAL TEST  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--2000/2138 STEP NO--UR/0032/70/036/003/0295/0298  
CIRC ACCESSION NO--AP0125721  
UNCLASSIFIED

2/2 027

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0125721

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONCORDANT RESULTS WERE OBTAINED BY MEASURING THE THERMAL COND. OF GRAPHITES USED IN CONSTRUCTION BY MEANS OF THE FOLLOWING METHODS: (1) AXIAL HEAT FLUX, (2) COMPARATIVE, (3) KOHLRAUSCH (1900), (4) POWELL AND SCHOFIELD (CA 33: 3649 PRIME5), AND (5) RADIAL HEAT FLUX WITH INDIRECT HEATING. THE THERMAL CONO. PASSES THROUGH A MAX. IN THE 50-350DEGREESK INTERVAL. EXPTL. DETAILS GIVEN.

UNCLASSIFIED

USSR

UDC 546.26-162

LUTKOV, A. I., VOLGA, V. I., DYMOV, B. K., LUKINA, E. YU., and TAMARIN, P. V.

"Thermal and Electrical Properties of Pyrolytic Graphite"

Moscow, Izvestiya Akademii Nauk SSSR, Neorganicheskiye Materialy, No 8, 1972, pp 1409-1416

Abstract: The authors studied the thermal and electrical properties of pyrolytic graphite produced by deposition of the products of pyrolysis of methane at 5-10 mm hg on the hot surface of polycrystalline graphite. Due to the comparatively low deposition temperature (2100°C), this pyrolytic graphite is initially high in defects. Following additional high-temperature annealing (3000°C and higher), the external appearance and x-ray structural analysis data of the material were similar to those of natural graphite single crystals. The heat conductivity, electrical conductivity, thermal expansion, and heat capacity of this graphite were studied. The electron heat conductivity was calculated at  $T < 10^4$  K. The mean defect-free area diameter in the crystalline lattice in the direction of the a-axis was 15000-18000 Å. Characteristic crystalline lattice temperatures were calculated ( $\theta_1 = 200^\circ\text{K}$ ,  $\theta_2 = 1200^\circ\text{K}$ ). The width of the forbidden zone in the direction of crystallographic axis c was 0.7 eV.

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USSR

UDC 546.26.:536.21

VOLGA, V. I., FROLOV, V. I. and USOV, V. K.

"Thermoconductivity of a Carbon Fiber"

Moscow, Neorganicheskiye Materialy, Vol 9, No 4, Apr 73, pp 712-713

Abstract: Results are presented of measuring the coefficient of thermoconductivity of a carbon fiber, produced by carbonization of polyacrylonitrile in the 80-320° K temperature interval. The samples of carbon fibers were sequentially heat-treated at 1400, 2600, and 2800°C. The amount of nitrogen in a sample heated at 1400°C did not exceed 0.2% and at 2800°C--10<sup>-4</sup>%. It was found that in the investigated temperature interval the thermoconductivity of a carbon fiber increases smoothly with increased temperature. In the heat treatment of carbon fibers the size of defect-free regions in the crystal lattice increases sharply, reaching the values of grain size characteristic for polycrystalline graphites. In the process of calculating grain sizes it was noted that the temperature at the start of the phonon-phonon interaction varies from 250°K for a sample heat treated at 1400°C down to 130°K for a sample heat treated at 2800°C. For most polycrystalline graphites this temperature is found in the limits of 110-130°K. 1 figure, 5 bibliographic references.

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USSR

UDC 536.63.546.26-162

LUTKOV, A. I., DYMOV, B. K., and VOLGA, V. I.

"The Relationship Between Thermal Conductivity and Electric Conductivity in Graphite"

Minsk, Inzhenerno-Fizicheskiy Zhurnal, Vol 22, No 5, 1972, p 932

Abstract: It is known that the thermal conductivity and electric conductivity of graphite are not subject to the law of Wiedemann-Franz. Heat transfer in graphite is accomplished by phonons, electric conductivity is determined by the motion of electrons and vacancies. Nevertheless, a number of researchers has noted that at room temperature, the product of thermal conductivity and electric resistivity is to a certain degree constant. However, no attempts have been undertaken to link these properties at high temperatures.

In the article are presented results of the measurement of thermal conductivity  $\lambda$  and electric resistivity  $\rho$ , and the product of these values,  $\lambda \times \rho$ , has been calculated within the range of 80 to 2500°K for artificial graphites with a volumetric weight from 1.0 to 2.26 g/cm<sup>3</sup>.

It was established that at low temperatures the values of  $\lambda \times \rho$  of various graphites differ considerably. At room temperature, the values of  $\lambda \times \rho$

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LUTKOV, A. I., et al., Inzhenerno-Fizicheskiy Zhurnal, Vol 22, No 5, 1972, p 932

of the investigated graphites are close to one another. Finally, at  $T > 1500^{\circ}\text{K}$ , for all the investigated graphites with the exception of graphites with the least ( $1.0 \text{ g/cm}^3$ ) and the greatest ( $2.26 \text{ g/cm}^3$ ) volumetric weight, the value of  $\lambda \times \rho$  is equal to  $0.34\text{--}0.38 \text{ volt}^2/\text{degree}$  and does not depend upon temperature.

This article has been deposited at the All-Union Institute of Scientific and Technical Information of the State Committee of the Council of Ministers, USSR, for Science and Technology and of the Academy of Sciences, USSR, Register No 3851-71 Det. (The article was received by the editors 9 Dec 1970, the abstract was received on 15 Nov, 1971. The complete text is 0.5-a.1. (expansion unknown), 9 references).

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USSR

UDC 543.272.6

TUSTANOVSKIY, V. T., ANDRYUSHCHENKO, V. I., VOL'GENUT, A. A., PROIZHAN, I. M., State Scientific Research and Planning Institute of the Rare-Metal Industry, Moscow

"The Neutron-Activation Method of Rapid Determination of the Carbon Content"

Moscow, Doklady Akademii Nauk SSR, Vol 196, No 3, 1971, pp 570-572

**Abstract:** The activation determination of carbon on the basis of a millisecond isotope permits hundreds of parallel cycles of radiation and measurement to be obtained in a short interval of time; this compensates for the insignificant value of the activation-process cross section. At the same time the background should not increase with the passage of time. The recording system described in the article, the design features of the radiation sensor, and the use of an amplitude discriminator tuned to the anomalously high radiation energy of the isotope  $\text{Bi}^{210}$  permits this requirement to be satisfied. This method permits rapid and sufficiently precise determination of the carbon content in steels, hard alloys, and other materials without destruction of the specimens. This method is most widely applicable in ferrous metallurgy, as well as in the control of finished products made of hard alloys, high-speed and tool steels. Two figures, 3 bibliographic entries.

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1/3 031 UNCLASSIFIED  
TITLE--WHO WILL FLY TO THE STARS -U- PROCESSING DATE--13NOV70  
AUTHOR--VOLGIN, B. ✓  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, AVIATSIYA I KOSMONAVTIKA, NO 3, 1970, PP 34-36  
DATE PUBLISHED-----70  
SUBJECT AREAS--SPACE TECHNOLOGY, BEHAVIORAL AND SOCIAL SCIENCES,  
BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--MANNED SPACE FLIGHT, ANABIOSIS, INTERSTELLAR TRAVEL, FLIGHT  
CREW, HEURISTIC MODEL  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FNAME--3006/0367 STEP NO--UR/0209/70/000/000/0034/0036  
CIRC ACCESSION NO--AP0134152  
UNCLASSIFIED

2/3 031

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0134152

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SPACE FLIGHTS TO STARS PRESENT PROBLEMS BECAUSE FLIGHTS EVEN AT THE SPEED OF LIGHT WOULD LAST LONGER THAN A HUMAN LIFETIME. TWO WAYS COULD BE USED FOR OVERCOMING THIS DIFFICULTY. THE FIRST IS TO SEND FAMILIES ABOARD SUCH SHIPS, WHO WOULD REPRODUCE EN ROUTE, WITH THE REMOTE DESCENDENTS OF THE ORIGINAL CREW REACHING THE STAR AND RETURNING TO EARTH. VOLUNTEERS PROBABLY WOULD STEP FORWARD FOR SUCH A PROJECT. WOULD SOCIETY ACCEPT SUCH A STEP? THE VOLUNTEERS CERTAINLY HAVE THE RIGHT TO SEAL THEIR OWN FATE, BUT WOULD IT BE FAIR TO THEIR OFFSPRING? THE SECOND WAS WOULD BE TO MAKE SUCH DISTANT FLIGHTS WITH THE COSMONAUTS IN A STATE OF ANABIOSIS, THAT IS, GREATLY SLOWING DOWN BIOLOGICAL PROCESSES WITHIN THEIR BODIES. THEORETICALLY, HUMAN LIFE COULD BE EXTENDED FOR A SUFFICIENT PERIOD (SOME SCIENTISTS BELIEVE THAT IN A STATE OF ANABIOSIS THE HUMAN BODY WOULD "AGE" ONLY ONE DAY PER YEAR. THE SAME CREW WOULD RETURN TO THE EARTH, BUT THEY WOULD FIND THEMSELVES IN A COMPLETELY DIFFERENT WORLD FROM THE ONE WHICH THEY LEFT AND THEY MIGHT SUFFER FROM PSYCHOLOGICAL DEPRESSION AND DEEP MELANCHOLY. A BETTER APPROACH IS TO CREATE A CYBERNETIC SYSTEM CONTROLLED BY AN ARTIFICIAL INTELLECT AND "DESIGNED" FOR PROLONGED FUNCTIONING IN THE MEGAWORLD. THIS ARTIFICIAL INTELLECT WOULD BE A COMPLEX INFORMATION COMPUTATION SYSTEM CONSTRUCTED BY HUMANS AND CAPABLE OF INDEPENDENT FORMULATION AND SOLUTION OF PROBLEMS, INCLUDING SELF CONTROL OF ITS OWN OPERATION.

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3/3 031

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0134152

ABSTRACT/EXTRACT--SUCH A SYSTEM IN THE FORM OF AN AUTOMATIC INTERSTELLAR OR INTERGALACTIC SPACESHIP AND HAVING AS ITS PRINCIPAL OBJECTIVE THE COLLECTION OF THE MAXIMUM USEFUL INFORMATION ON THE MEGAWORLD, CAN REACH THE MOST DISTANT REGIONS OF THE UNIVERSE. IT IS NOW CLEAR THAT SUCH A SYSTEM CAN BE DEvised, BUT ITS DESIGN INVOLVED TRULY ENORMOUS DIFFICULTIES. HEURISTIC PROGRAMMING IS INVOLVED; THIS IS ESSENTIALLY MATHEMATICAL SIMULATION OF HUMAN MENTAL ACTIVITY IN THE SOLUTION OF NONTRIVIAL PROBLEMS. IT IS NECESSARY TO BEGIN SOLUTION OF ANY SPECIFIC PROBLEM WITH AN ANALYSIS OF THE COURSE OF HUMAN THOUGHT AND THE SEQUENCE OF OPERATIONS IN THE HUMAN BRAIN. THE SYSTEM WOULD HAVE TO ENSURE ITS OWN SELF EXISTENCE, SELECT ITS DIRECTION OF MOVEMENT IN THE MEGAWORLD, DECIDE HOW TO INVESTIGATE UNKNOWN MEDIA AND TRANSMIT INFORMATION TO EARTH. THE ENTIRE PROJECT AT THIS TIME IS AT THE FRONTIER OF SCIENTIFIC CAPABILITIES.

UNCLASSIFIED

USSR

UDC: 8.74

VOLGIN, B. N., YUKHIMCHUK, S. A.

"Optimizing Modular Redundancy in a Circuit With a Quorum Element for Equipment With Two Types of Failures Unequal in Damage Value"

V sb. Osnovn. vopr. teorii i praktiki nadezhnosti (Basic Problems in the Theory and Practice of Reliability--collection of works), Moscow, "Sov. radio", 1971, pp 155-167 (from RZh-Kibernetika, No 1, Jan 72, Abstract No 1V964)

Translation: The author proposes use of a standby circuit whose failures result in minimum expected damage as optimum redundancy with quorum element assuming a given multiplicity for an equipment module with two types of failures which are unequal in damage value. The concept of an equivalent redundancy module is introduced, enabling quantitative analysis with a fair degree of generality. An algorithm is described for digital computer determination and comparison of reliability characteristics of all possible schematic diagrams of redundancy. Graphs of regions of domination are presented for direct determination of the optimum circuit when the reliability characteristics of the initial module and the relation between damages from failures of each type are known. Authors' abstract.

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USSR

UDC: 621.375

VOLGIN, L. I.

"Design Methods of Reducing the Multiplicative Error of Amplification Devices"

Dokl. Vses nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 3 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 3), Novosibirsk, 1970, pp 80-84 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1D112)

Translation: Amplification devices may be classified into several groups according to the nature and method of error signal compensation. General considerations are given on the properties of two groups (with and without separation of the error signal and the useful signal). Bibliography of five titles. E. L.

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1/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--MECHANISM OF THE SEPARATION OF LIQUID SOLUTIONS DURING EVAPORATION  
THROUGH POROUS MEMBRANES -U-  
AUTHOR-(03)-VOLGIN, V.D., DYTNERSKIY, YU.I., PLANDOVSKIY, A.N.  
COUNTRY OF INFO--USSR  
SOURCE--TEOR. OSN. KHIM. TEKHNOL. 1970, 4(2), 271-5  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--POROSITY, CHEMICAL SEPARATION, EVAPORATION, ALIPHATIC ALCOHOL,  
CELLULOSE RESIN, ACETATE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--3001/0140 STEP NO--UR/0455/70/004/002/0271/0275  
CIRC ACCESSION NO--AP0125956  
UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0125956

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONC. PROFILES FOR 3 MODELS OF MEMBRANE SEPN. WITH HIGH PORE, CAPILLARY PORE AND POLYMER MEMBRANES ARE DISCUSSED. THE SEPN. MECHANISM OF WATER SOLNS. OF ME, ET, PR, BU, ISO-BU ALCS. AND OF ACETONE BY MEANS OF 2 DIFFERENT CELLULOSE ACETATE MEMBRANES WAS INVESTIGATED. THE DEPENDENCE OF THE EVAPN. RATE, THE SELECTIVITY, AND THE SEPN. COEFFS. ON THE MEMBRANE PRESSURES ARE GRAPHICALLY PRESENTED. FACILITY: MOSK. INST. KHIM. MASHINDSTR., MOSCOW, USSR.

UNCLASSIFIED

Pharmacology and Toxicology

USSR

UDC: 577.1:615.7/9

MIKHAYLOV, N. Ye., IVAKHNIKOVA, I. G., VOLGINA, A. V., and STUKOVA, I. A.

"Action of Methyl Ester of Acrylic Acid on an Organism After Inhalational Administration"

Materialy Nauchn. konferentsii po vopr. gigiyeny i profpatol. v. khim. prom-sti--Sbornik (Materials of the Scientific Conference on Problems of Hygiene and Occupational Pathology in the Chemical Industry -- Collection of Works), Saratov, 1970, pp 41-43 (from Referativnyy Zhurnal -- Biologicheskaya Khimiya, No 7, 10 Apr 71, Abstract No 7F2391)

Translation: A study was made of the activity in blood of cholinesterase, catalase, and the content of SH-groups, G-SH, and Hb in rats subject to inhalational intoxication with the methyl ester of acrylic acid (I; 5-50 mg/m<sup>3</sup>; 4 hours). The activity of cytochromoxidase was determined after seven months in liver and brain homogenates, while the activity of succinated hydrogenase was determined in liver homogenates. Determinations were also made of the vitamin C and cholesterol concentrations in blood serum. The toxic effect of I at a concentration of 50 mg/m<sup>3</sup> was shown; reduced redox reactions and threshold effect on the gonads was observed at a concentration of 20 mg/m<sup>3</sup>. Concentrations of 10 and 5 mg/m<sup>3</sup> were not toxic.

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USSR

UDC 538.69:539.143.4

BUISEVILI, L. L., VOLGINA, G. A. ✓

"Calculation of Nuclear Spin Diffusion Coefficient in the Relaxation of Quadrupole Systems"

Tr. Yestestvennonauchn. In-Ta Pri Permsk. Un-Te [Works of Natural Science Institute of Perm' University], Vol 12, No 2, 1969, pp 243-245 (translated from Referativnyy Zhurnal Fizika, No 7, 1970, Abstract No 7D541 from the resume)

Translation: The method of construction of a nonequilibrium density matrix is used to analyze one possible mechanism of relaxation of quadrupole systems related to spin diffusion in the presence of paramagnetic impurities in crystals. The spin diffusion coefficients calculated exceed the existing coefficients for the case of the Zeeman system.

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USSR

UDC 620.199

VOLIKOVA, I. G., Scientific Research Institute of Chemical Machine Building

"Rapid Method of Determining the Resistance of Corrosion-Resistant Steels in Acid and Neutral Mediums"

Moscow, Zashchita Metallov, Vol 7, No. 4, Jul-Aug 71, pp 427-431

Abstract: A rapid method is described for determining the electrochemical state and rating the group of corrosion-resistant steels in an aggressive medium. The method is good for cases where the potential of the metal is determined by the method of self-dissolution and imposing a specific anodic current. The transition of the latter into the ionic solution  $Fe^{2+}$  characterizes the corrosion rate; thus a current of  $10 \mu A/cm^2$  corresponds to a corrosion rate of  $0.1 g/cm^2-hr$ , that is a corrosion-resistant material, a  $100 \mu A/cm^2$  current - a less corrosion-resistant material, and  $40 \mu A/cm^2$  - an intermediate material. Consequently, the shifting of the potential by imposing on the investigated specimen an anodic current of  $10 \mu A/cm^2$  indicates that the metal is

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VOLIKOVA, I. G., Zashchita Metallov, Vol 7, No 4, Jul-Aug 71, pp 427-431

corrosion-resistant in the medium in question. Demonstrated results of investigating steels Kh18N10T, Kh17N13M2T, and Kh23N28M3D3G by the discussed method comply with corrosion tests and potentiostatic and polarization curves. It is concluded that the described rapid method yields more objective information than the gravimetric method for the case of nonresistant passivity and similar information for passive conditions in the limits of the corrosion-resistant ball. Three illustr., one table, one biblio. ref.

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172 045 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--CAVITATION RESISTANCE OF GRAPHITE MATERIALS -U-  
AUTHOR--(03)-SAMOKHIN, I.N., SEMENOV, M.YE., VOLIN, V.E.  
COUNTRY OF INFO--USSR  
SOURCE--TSVER. METAL. 1970, 43(3), 44-5  
DATE PUBLISHED-----70  
SUBJECT AREAS--METHODS AND EQUIPMENT, MATERIALS  
TOPIC TAGS--GRAPHITE, CAVITATION, PHYSICS LABORATORY INSTRUMENT, COKE,  
COAL, ULTRASONIC TEST APPARATUS/(U)UZM45 ULTRASONIC TEST INSTRUMENT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/2098 STEP NO--UR/0136/70/043/003/0044/0045  
CIRC ACCESSION NO--AP0125682  
UNCLASSIFIED

2/2 045

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0125682

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CAVITATION STABILITY WAS DETD. IN  
TRIPPLICATE FOR 8 GRAPHITE SAMPLES (CYLINDERS 15 TIMES 5 MM.) BY USING  
THE MAGNETOSTRICTION VIBRATOR OF ULTRASONIC APP. UZM-45 AT 20 KHZ FOR  
30 MIN WITH CONTINUOUSLY COOLED H SUB2 O. WT. LOSS WAS MEASURED AND  
CALCD. TO HEIGHT LOSS. THE GREATER THE HOMOGENEITY OF THE SAMPLE IN  
CONTENT AND NATURE OF COMPONENTS, THE GREATER IS THE CAVITATION  
STABILITY. THE MOST HOMOGENEOUS GRAPHITE WAS MADE FROM RAW COKE AND  
COAL CAKE. WITH SAMPLES OF THE SAME COMPN. THE HEIGHT LOSS DECREASED  
LINEARLY AS COMPRESSIVE STRENGTH INCREASED, BUT FOR DIFFERENT COMPNS.  
THESE LINES HAD DIFFERENT SLOPES.

UNCLASSIFIED

USSR

VOLINETS', L. K., Ukrainian Scientific Research Institute of Agricultural microbiology

"Some Properties of the Toxin of Enteropathogenic Strains of Escherichia coli"

Kiev, Mikrobiologicheskii Zhurnal, Vol 33, No 6, Nov/Dec 71, p 748

Abstract: The immunogenic properties of the endotoxin of E. coli were studied. By using the tryptaflavine reaction, 106 toxicogenic strains were selected from 126 strains of E. coli isolated from the carcasses and feces of calves with toxic dyspepsia. The highest toxin activity developed on cultivation of the toxicogenic strains in Hottinger broth containing 0.5 percent glucose or 10 percent milk. To prepare toxoid, the toxin of four enteropathogenic strains of E. coli isolated from the mesenteric lymph nodes of calves that died at the age of 3-4 days was used. On cultivation of the strains at 37-38°C for 7 days in the culture media indicated, the cultures were stirred and filtered. Upon addition of 0.3 percent formalin to the toxin, the mixtures were kept for two days at constant temperature. Fourteen days after subcutaneous injection of mice with 0.5 ml of toxoid from every strain, the mice were given a subcutaneous injection of a lethal dose of culture of the homologous strain or of a lethal dose of the toxin. The mice immunized with the toxoid survived,

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USSR

VOLINETS', L. K., Mikrobiologicheskii Zhurnal, Vol 33, No 6, Nov/Dec 71, p 748

while all control mice died. By hyperimmunization of rabbits with the toxoid, an antitoxic serum was obtained which protected mice from lethal doses of the toxin.

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USSR

UDC 539.3

VOLK, S. I., (Kiev), Institute of Mechanics, Ukrainian SSR

"Cyclically Symmetrical Deformation of Shells of Revolution with Meridional Ribs"

Kiev, Prikladnaya Mekhanika, Vol 7, No 8, 1971, pp 16-23

Abstract: A method is proposed for calculating thin elastic shells of revolution of variable thickness with regularly situated identical rib-type rods of variable rigidity with symmetrical force and temperature influences with respect to the ribs. The method is based upon the refinement of a structurally orthotropic system. Here the forces of interaction with the ribs are considered to be distributed along the parallel of the shell according to a law corresponding to their expansion into a trigonometric series with the retention of two terms of the series. The method is confirmed on the basis of the example of a truncated conical shell. This method makes it possible to take approximately into account the discrete position of the ribs. Its limits of application depend both upon the geometrical parameters of the ribbed shell, and upon the nature of the external influences. Up to now, no works exist in which a comprehensive investigation has been made of the accuracy and limits

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I/2 029  
UNCLASSIFIED  
TITLE--PHOTODISPROPORTIONATION OF ARENE CYCLOPENTADIENYL IRON COMPOUNDS  
-U-  
AUTHOR--(03)-NESMEYANOV, A.N., VOLKENAU, N.A., SHILOVTSEVA, L.S.  
COUNTRY OF INFO--USSR  
SOURCE--DOKL. AKAD. NAUK SSSR, 1970, 190(4), 857-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--IRON COMPOUND, FERROCENE, UV RADIATION, ORGANIC SOLVENT,  
ABSORPTION SPECTRUM, PHOTOCHEMISTRY, BORON FLUORIDE, FURAN,  
DIOXANE, ETHYL ETHER, ACETONITRILE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1984/1562  
STEP NO--UR/0020/70/190/004/0857/0859  
CIRC ACCESSION NO--AT0100180  
UNCLASSIFIED

2/2 029

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--ATO100180

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. UV IRRADN. OF C SUB6 H SUB6 FEC SUB5 H SUB5.BF SUB4 YIELDS UP TO 100PERCENT FERROCENE, FREE AROM. HYDROCARBON, AND INORG. FE AS FE(BF SUB4) SUB2. THE FOLLOWING PERCENT YIELDS OF THE REACTION WERE OBSD. IN INDICATED SOLVENTS: THF 76; DIOXANE 42; (CH SUB2 OME) SUB2 15; ET SUB2 O 10; MEOPH, 0; ETOAC, TRACE; MECN, 20; ME SUB2 CO, 15; AC SUB2 O, 8; ACOH, 0; H SUB2 O, TRACE; MECH, 0; ETOH, 0; C SUB6 H SUB6 TRACE; PHNH SUB2, 3; PYRIDINE, 2. THE YIELDS WERE 0 IN PETROLEUM ETHER, MENO SUB2, ME SUB2 NCHO, ME SUB2 SO, MORPHOLINE, AND PIPERIDINE. NO DIRECT CONNECTION BETWEEN THE ABSORPTION SPECTRUM OF THE SOLVENT AND ITS REACTION EFFECTIVENESS WAS OBSD. THE FOLLOWING PERCENT YIELDS OF FERROCENE FROM SIMILAR DISPROPORTIONATION OF ARFEC SUB5 H SUB5 CATIONS WERE OBSD. UNDER THESE CONDITIONS (RUN IN THF): C SUB6 H SUB6, 42; MEPH, 32; 2,5-ME SUB2 C SUB6 H SUB4, 30; 1,3,5-ME SUB3 C SUB6 H SUB3, 20; CLPH, 30; MEOPH, 25; HO SUB2 CPH, 30; WITH ZERO YIELD FOR AR EQUALS PH SUB2, ETO SUB2 CPH, PHCN. THE FOLLOWING PERCENT YIELDS WERE OBTAINED WITH ANALOGS: 1,3,5-ME SUB3 C SUB6 H SUB3.FEC SUB5 H SUB4 ET PRIME POSITIVE 0; C SUB6 H SUB6 FEC SUB5 H SUB4 PH PRIME POSITIVE 48; C SUB6 H SUB6 FEC SUB5 H SUB4 CL PRIME POSITIVE 20; 1,3,5-ME SUB3 C SUB6 H SUB3 FEC SUB5 H SUB4 AC PRIME POSITIVE 5PERCENT. ALL REACTIONS WERE RUN IN DRY ARGON ATM.

UNCLASSIFIED

1/2 011 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--INTERACTION OF BENZENECYCLOPENTADIENYLIRON FLUOROBORATE WITH SODIUM  
NAPHTHALENE -U-  
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PROCESSING DATE--09OCT70

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE REACTION IS: 2(C SUB6 H SUB6 FEC SUB5 H SUB5)BF SUB4 PLUS (C SUB10 H SUB8) NEGATIVE NA POSITIVE MINUS(THF) YIELDS (C SUB5 H SUB5) SUB2FE PLUS 2C SUB6 H SUB6 PLUS (FE) PLUS 2NABF SUB4 PLUS C SUB10 H SUB8. THE FOLLOWING WERE OBSD. (RATIO OF REACTANTS, TEMP., SOLVENT, AND PERCENT YIELD (C SUB5 H SUB5) SUB2 FE GIVEN): 1:1, 20-5DEGREES, THF, 41; 1:1.25, 40DEGREES, THF, 42; 1:2, 20-5DEGREES, THF-MECN, 61.5; 1:2, MINUS 20DEGREES, THF-MECN, 33; 1:2, 20-5DEGREES, (MEDCH SUB2) SUB2, 50. WHEN THE REACTION MIXT. WAS TREATED WITH AQ. TL SUB2 SO SUB4 AND KOH, C SUB5 H SUB5 TL WAS OBTAINED. FACILITY: INST. ELEMENTOORG. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

Luminescence

USSR

UDC 541.128

VOL'KENSHTEYN, F. F., PEKA, G. P., and MALAKHOV, V. V., Institute of Physical Chemistry, Academy of Sciences USSR, Moscow and Kiev State University imeni T. G. Shevchenko

"The Effect of Adsorption on the Luminescence of Semiconductors. II. Exciton Luminescence"

Moscow, Kinetika i Kataliz, Vol 14, No 5, Sep/Oct 73, pp 1269-1273

Abstract: Theoretical and experimental study was carried out on the effect of adsorption on exciton luminescence of semiconductors, which results from the annihilation of light-generated excitons on non-ionized admixture centers inside the crystals. The measurements were carried out in the infrared range of luminescence of  $\text{Cu}_2\text{O}$  ( $\lambda_{\text{max}} = 0.96 \text{ } \mu\text{m}$ ). It was established that adsorption of water and oxygen on  $\text{Cu}_2\text{O}$  leads to considerable extinction of the luminescence. The conclusion was reached that the principal mechanism of the adsorption effect on exciton luminescence of  $\text{Cu}_2\text{O}$  is the increased rate of surface annihilation of excitons resulting from the appearance of nonradiating annihilation centers of the adsorption type origin.

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USSR

UDC 537.311.33

VOL'KENSHTEYN, F. F.

"Physics and Chemistry of the Surface of Semiconductors"

Moscow, Fiziko-Khimiya Poverkhnosti Poluprovodnikov, Izd-vo Nauka, 1973, 400 pp

Translation of Annotation: This monograph deals with the physico-chemical processes taking place on the surface of a semiconductor, mainly the processes of chemical adsorption. The book has a theoretical character although a rather exhaustive summary of experimental data is given in it.

The book basically contains original material and reflects investigations of the author and his associates. It contains material from the small monograph by the author entitled "Electron Theory of Catalysis on Semiconductors" published in 1960.

The book consists of six chapters: 1. Electrons and Holes in a Semiconductor; 2. Different Types of Adsorption; 3. Electron

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VOL'KENSHTEYN, F. F., Fiziko-Khimiya Poverkhnosti Poluprovodnikov,  
Izd-vo Nauka, 1973, 400 pp

Processes on the Surface of a Semiconductor During Chemisorption;  
4. Interaction of a Surface With the Body of a Semiconductor;  
5. Catalytic Effect of a Semiconductor; and 6. Processes on a  
Real Surface.

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